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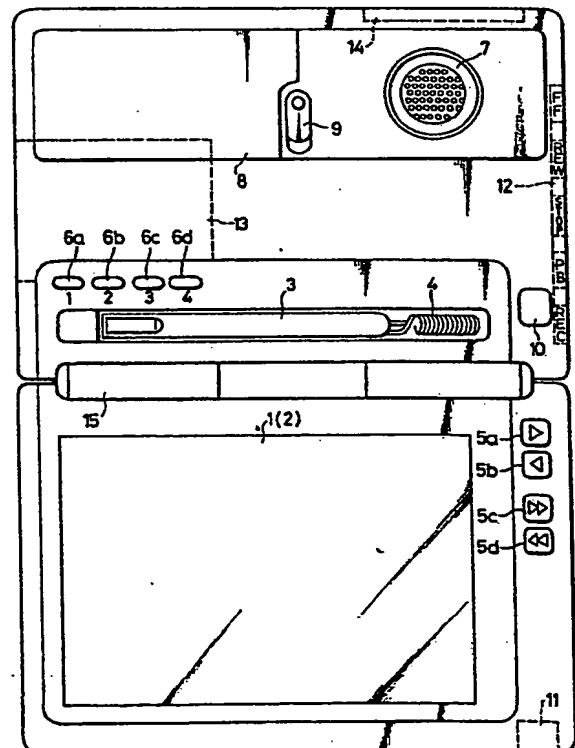
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(54) Portable computers.

(57) A portable computer has incorporated therein a central processing unit (21), a display apparatus (1) and a timer circuit (27). The computer is also provided with exclusive operation keys (6a to 6d) whereby image data corresponding to a predetermined condition can be displayed on the display apparatus (1) merely by depressing the predetermined exclusive operation key (6a to 6d), and schedule data judged from the date of the present time can also be displayed on the display apparatus (1) merely by depressing the predetermined exclusive operation key (6a to 6d).

FIG. 1



EP 0 373 961 A2

## PORTABLE COMPUTERS

This invention relates to portable computers.

A portable computer has been proposed which incorporates therein a central processing unit (CPU) for controlling schedule data such as diary data, and a display portion for displaying the schedule data. With this computer, when the user wants to see and compare schedules on two different dates, the user has to operate keys to input two dates alternately to access the schedules of the respective dates.

Moreover, when the user wants to see desired data, the user has to input a particular keyword in the data to retrieve desired data. Thus, when the user wants to see the desired data very often, these operations are cumbersome, and also particular data cannot be accessed immediately.

Furthermore, when the user wants to see a schedule for "today", the user has to operate a plurality of keys such as a year key, a month key and a day key. Also the user has to operate a "retrieval key", a "check key" and so on. Therefore, the user cannot check the schedule for "today" without cumbersome operations.

According to the present invention, there is provided a portable computer comprising:  
control means for controlling input data as a unit of page according to a program;  
memory means for storing said input data;  
display means for displaying an image of said input data as each said page; and  
an exclusive operating key for generating a signal which detects one of said pages corresponding to a predetermined condition, whereby said control means outputs an image corresponding to said detected page by the signal from said memory means, and displays said image on said display means.

According to the present invention, there is also provided a portable computer comprising:  
control means for controlling input data as a unit of page according to a program;  
memory means for storing said input data;  
display means for displaying an image of said input data as each said page; and  
an exclusive operating key for generating a signal corresponding to said page displayed on said display means to be stored at a logic address in a predetermined address area of said memory means, whereby said control means outputs said logic address of said page from said predetermined address area by operating said key, and displays said image on said display means.

According to the present invention, there is also provided a portable computer comprising:  
control means for controlling input schedule data

according to a program;

memory means for storing said schedule data,

display means for displaying an image of said time-of-day;

5 timer means for counting data of date and time-of-day; and

an exclusive operating key for generating a signal which detects one of said schedule data corresponding to a predetermined condition, whereby  
10 said control means detects data of date and time-of-day corresponding to said condition by operating said key, and outputs schedule data corresponding to said data and time-of-day from said memory.

According to the present invention, there is also provided a method of controlling a portable computer which controls input data as a unit of page according to a program, the method comprising:  
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a first step for outputting a logic address of said page corresponding to a predetermined address area of memory means from said memory means by an exclusive operating key;

a second step for outputting an image of said page corresponding to said logic address from said  
25 memory means; and

a third step for displaying said image output.

According to the present invention, there is also provided a method of controlling a portable computer which controls input data as schedule data by a program, the method comprising:  
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a first step for detecting a predetermined condition by operating an exclusive key;

a second step for detecting a date and a time-of-day from a timer apparatus in accordance with said  
35 condition;

a third step for outputting a schedule in accordance with said date and said time-of day; and

a fourth step for displaying said schedule on display means.

Thus an embodiment of the present invention can provide a portable computer in which the user can see a predetermined schedule merely by depressing an exclusive operation key.

The invention will now be described by way of example with reference to the accompanying drawings, throughout which like parts are referred to by like references, and in which:

Figure 1 is a front view of an embodiment of portable computer according to the present invention;  
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Figure 2 is a block diagram showing a hardware arrangement of the computer of Figure 1;

Figure 3 is a pictorial representation of an example of a picture displayed on a display screen of the computer; and

Figures 4 and 5 are flow charts for explaining the operation of the computer.

Referring to Figure 1, the portable computer comprises a display portion 1 formed by a liquid crystal display (LCD) device or the like, which displays thereon image data derived from a CPU which will be explained later. A so-called input tablet 2 can be formed of a so-called transparent touch sensor, and is provided on the surface of the display portion 1. A tablet pen 3 is placed on the front wall of the computer and is used to input desired data in co-operation with the input tablet 2. When the user takes the pen 3 and touches the input tablet 2 with the point thereof, information such as a touched position is supplied through a cord 4 to the CPU, thereby inputting desired data. Predetermined keys 5a, 5b, 5c, 5d and 6a, 6b, 6c, 6d are shown, and signals therefrom are also supplied to the CPU.

The computer also comprises a loudspeaker 7 and a battery compartment 8 in which a power source battery (not shown) is accommodated under a lid which is openable and/or closable by operating a locking mechanism 9. The computer is powered ON and OFF by a power switch 10.

Block portions shown by phantom lines in Figure 1 show the positions of various mechanisms provided on the side wall of the computer, including a microphone 11, and an operation key 12 used to effect so-called solid state IC recording which will be described later. When the key 12 is operated, an audio signal supplied to the microphone 11 is recorded and can be reproduced from the loudspeaker 7. There is also an IC card socket 13 to which IC cards such as a read only memory (ROM), a random access memory (RAM) and the like can be connected, and a socket 14 to which can be connected an external apparatus in order to expand the facilities of the computer.

A hinge 15 incorporates therein a flexible substrate or the like to transmit signals, so that the user can fold the computer in two without electrical problems. The computer is about 29 cm high and about 20.5 cm wide in the extended state. In the folded state, it is about 4 cm thick. The size of the display portion 1 is about 15 cm x 10 cm.

In Figure 2, it will be seen that a CPU 21 is connected through a bus line 22 to various kinds of functions ICs which will be explained below. A ROM 23 is shown to store therein, in addition to a system program of the whole computer, a Japanese kana-kanji converting program for a word processor function in the Japanese language, dictionary data for such kanji-kana conversion, a program for recognizing hand-written input data, and dictionary data for such recognizing program.

A RAM 24 provides a work area, and a back-up RAM 25 is provided with a power supply source

26. A timer IC 27 is driven by the power supply source 26, and counts a clock signal from a quartz oscillator 28 constantly to generate data of date and time at a certain time point.

The following elements are associated with the interconnection to the respective portions shown in Figure 2, and will be explained.

A display controller 29 controls the display portion 1. The display controller 29 is controlled by the CPU 21, and display data formed by the CPU 21 are written in a video-RAM 30. The data written in the video-RAM 30 are supplied to the display portion 1 via the display controller 29.

An interface circuit 31 is connected to the input tablet 2 and to the pen 3, and data written on the input tablet 2 are supplied to the CPU 21 via the interface circuit 31.

A solid state recording processing circuit 32 processes an audio signal from the microphone 11 in a predetermined signal processing manner such as analogue-to-digital (A/D) conversion. The audio signal thus processed is stored in the back-up RAM 25 via the CPU 21. The audio signal data stored in the back-up RAM 25 are supplied to the processing circuit 32, in which it is digital-to-analogue (D/A) converted, and the analogue audio signal data are supplied through a mixer 33 to the loudspeaker 7.

A so-called dialler circuit 34 is provided to generate an acoustic signal corresponding to a dual tone of a so-called push-type phone when supplied with data such as a desired telephone number and the like from the CPU 21. The acoustic signal from the dialler circuit 34 is supplied through the mixer 33 to the loudspeaker 7.

A key interface circuit 35 is shown to receive a signal supplied directly or via a power supply source circuit 36 from a key group such as the keys 5a to 5d, 6a to 6d, 10 and 12. The predetermined, converted signal is supplied from the key interface circuit 35 to the CPU 21. The power switch 10, the keys 6a to 6d and the key 12 except the stop button are connected to the interface circuit 35 via the power supply source circuit 36, whereby when these keys are operated, the power supply source circuit 36 is actuated, and information corresponding to the key operation is then fed therefrom to the interface circuit 35. An IC card interface circuit 37 is connected to the socket 13 to supply data from the IC card through the bus line 22 to the CPU 21. An interface circuit 38 is connected to the bus line 22 and to the socket 14 to expand the system of the computer.

With this portable computer, if any one of the keys 6a to 6d, for example, the key 6b is depressed under the condition that an image indicating the schedule of "today" is displayed on the display portion 1 as, for example, shown in Figure

3, then the logic address of the page displayed will be stored in a predetermined address area of the back-up RAM 25. The thus stored condition is represented when a "bookmarker" on, for example, the upper left corner of the display portion 1 is inserted as [2]. Thus, a desired page is opened hereinafter. Then, if the key 6b is depressed, the stored logic address data will be read from the predetermined address area of the back-up RAM 25, thereby displaying the page indicated by the read logic address data.

More specifically, a routine shown in a flow chart of Figure 4 is provided in the system program which is written in the ROM 23.

Referring to Figure 4, when any one of the keys 5a to 5d and 6a to 6d is depressed, the operation is started. Then, it is determined in each of decision steps ST-1 to ST-4 whether or not any one of the keys 6a to 6d is depressed. If a NO is output in all steps ST-1 to ST-4, then the routine proceeds to step ST-5, whereat other processing is executed. At the completion of the processing in step ST-5, the routine is ended. If a YES is output in any one of steps ST-1 to ST-4, corresponding address data stored in the back-up RAM 25 are read in steps ST-6 and ST-9. Further, existence or non-existence of data is judged in the next decision step ST-10. If it is determined in step ST-10 that no data exist, then the routine proceeds to step ST-11, whereat logic address data of the page displayed at this time are written in the corresponding address area of the RAM 25. If it is determined in step ST-10 that data exist, then the routine proceeds to step ST-12, whereat the logic address data of the data are detected. Then, the routine proceeds to step ST-13, in which image data of the page corresponding to the logic address data are read from the back-up RAM 25, and an image of the corresponding page is displayed on the display portion 1 in step ST-14.

Therefore, when the keys 6a to 6d are operated, a character [bookmarker] is inserted into the page opened at the time. When the same keys 6a to 6d are operated under the condition that any other page is opened, the page indicated by the character [bookmarker] can be accessed immediately. Thus, the user can operate this computer as if the user had slipped a bookmarker between the pages of the book. Thus, when the user puts [bookmarkers] in pages of two dates, the user can compare these pages by alternately opening them. Also, when the user puts the [bookmarkers] in the pages of data which are used very often, the user can readily see these pages.

Thus, the user can see the page corresponding to the desired condition (marked with the [bookmarker]) merely by depressing the desired one of the exclusive operations keys (keys 6a to

6d). Thus, the operation of the computer can be carried out with great ease with (only one operation).

Moreover, if any one of the keys 6a to 6d is depressed under the condition that the page, marked with the [bookmarker] is displayed on the display portion 1, then data on the corresponding address area of the RAM 25 will be erased and the [bookmarker] inserted may be removed.

The operation by the over-mentioned keys 6a to 6d is not limited to the [bookmarker], and the above keys 6a to 6d may be operated in cooperation with, for example, the timer IC 27 so that a page of schedule such as data of "today" may be accessed. Alternatively, the preceding page displayed during a period of more than a predetermined time may be accessed or when the pages of the whole system of the portable computer are classified as several items, the first page, the last page and the blank page of the displayed item may be accessed.

The operation of the computer will be further explained with reference to the flow chart of Figure 5, which is prepared in the system program written in the ROM 23. When any one of the above keys 10, 6a to 6d and 12 is operated, the operation is started, and the power supply source circuit 36 is actuated at step ST-21. In the next decision step ST-22, it is determined whether or not "today" is set the depressed key. If a YES is output at step ST-22, then the routine proceeds to step ST-23, in which the date of "today" is read from the timer IC 27. In the next step ST-24, the logic address for internally processing the date of today read is calculated, and in step ST-25, data corresponding to this logic address is read from the RAM 25, and the data thus read is displayed on the display portion 1 at step ST-26. Then, other data processing is performed in step ST-27, and at the completion of the processing in step ST-27, the routine is finished (ended). If a NO is output at step ST-22, then the routine directly proceeds to step ST-27, whereat other data processing is performed as described above.

Thus, the user can see the schedule of a predetermined date (today) whereby by depressing desired one of the exclusive operating keys (for example, key 6a).

In the computer as described above, the operation by the key 6a is similarly performed even after the power supply source circuit 36 has already been actuated by any other key. The user can see the schedule of "today" by depressing the key 6a during other operations.

Moreover, schedule data of "yesterday" and of "tomorrow" are set in the keys 6b and 6d other than the key 6a in which schedule data of "today" are set, whereby the user can see these schedule

data. Furthermore, days are set in the keys 6a to 6d, whereby the user can see schedule data of a particular day.

### Claims

1. A portable computer comprising:  
control means (21) for controlling input data as a unit of page according to a program;  
memory means (25) for storing said input data;  
display means (1) for displaying an image of said input data as each said page, and  
an exclusive operating key (6a to 6d) for generating a signal which detects one of said pages corresponding to a predetermined condition, whereby said control means (21) outputs an image corresponding to said detected page by the signal from said memory means, (25) and displays said image on said display means (1).

2. A portable computer comprising:  
control means (21) for controlling input data as a unit of page according to a program;  
memory means (25) for storing said input data;  
display means (1) for displaying an image of said input data as each said page; and  
an exclusive operating key (6a to 6d) for generating a signal corresponding to said page displayed on said display means (1) to be stored at a logic address in a predetermined address area of said memory means (25) whereby said control means (21) outputs said logic address of said page from said predetermined address area by operating said key, (6a to 6d) and displays said image on said display means (1).

3. A computer according to claim 1 or claim 2 wherein said control means (21) displays a character of bookmark as a method of directing said image of said page.

4. A portable computer comprising:  
control means (21) for controlling input schedule data according to a program;  
memory means (25) for storing said schedule data,  
display means (1) for displaying an image of said time-of-day;  
timer means (27) for counting data of date and time-of-day; and  
an exclusive operating key (6a to 6d) for generating a signal which detects one of said schedule data corresponding to a predetermined condition, whereby said control means (21) detects data of date and time-of-day corresponding to said condition by operating said key (6a to 6d), and outputs schedule data corresponding to said date and time-of-day from said memory (25).

5. A computer according to claim 4 wherein said predetermined condition means that said control means (21) generates a signal of data of

"today", and outputs data of the schedule of "today" from said memory.

6. A method of controlling a portable computer which controls input data as a unit of page according to a program, the method comprising: a first step for outputting a logic address of said page corresponding to a predetermined address area of memory means (25) from said memory means (25) by an exclusive operating key;  
a second step for outputting an image of said page corresponding to said logic address from said memory means (25); and  
a third step for displaying said image output.

7. A method of controlling a portable computer which controls input data as schedule data by a program, the method comprising:  
a first step for detecting a predetermined condition by operating an exclusive key (6a to 6d);  
a second step for detecting a date and a time-of-day from a timer apparatus (27) in accordance with said condition; a third step for outputting a schedule in accordance with said date and said time-of-day; and a fourth step for displaying said schedule on display means (1).

FIG. 1

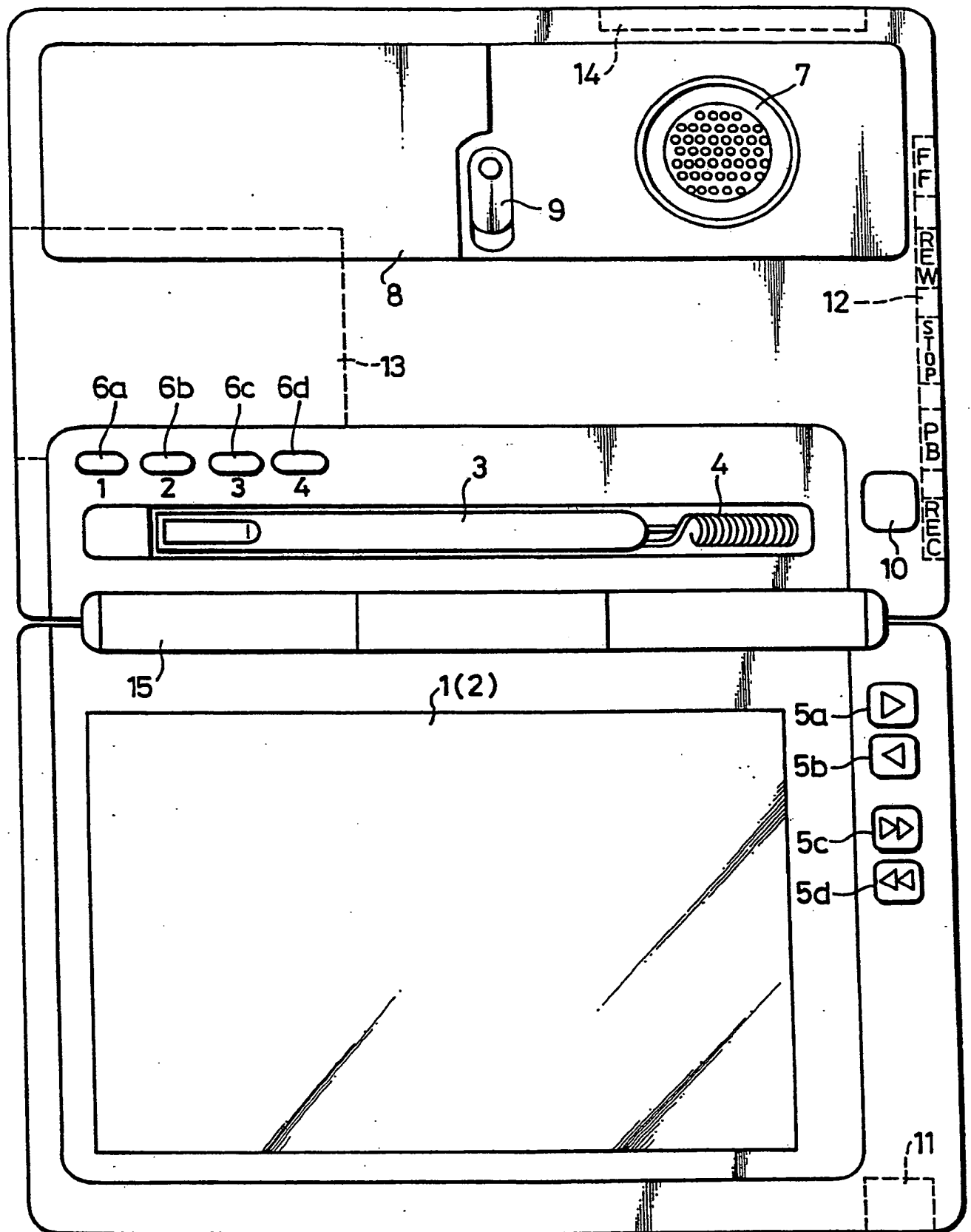


FIG. 2

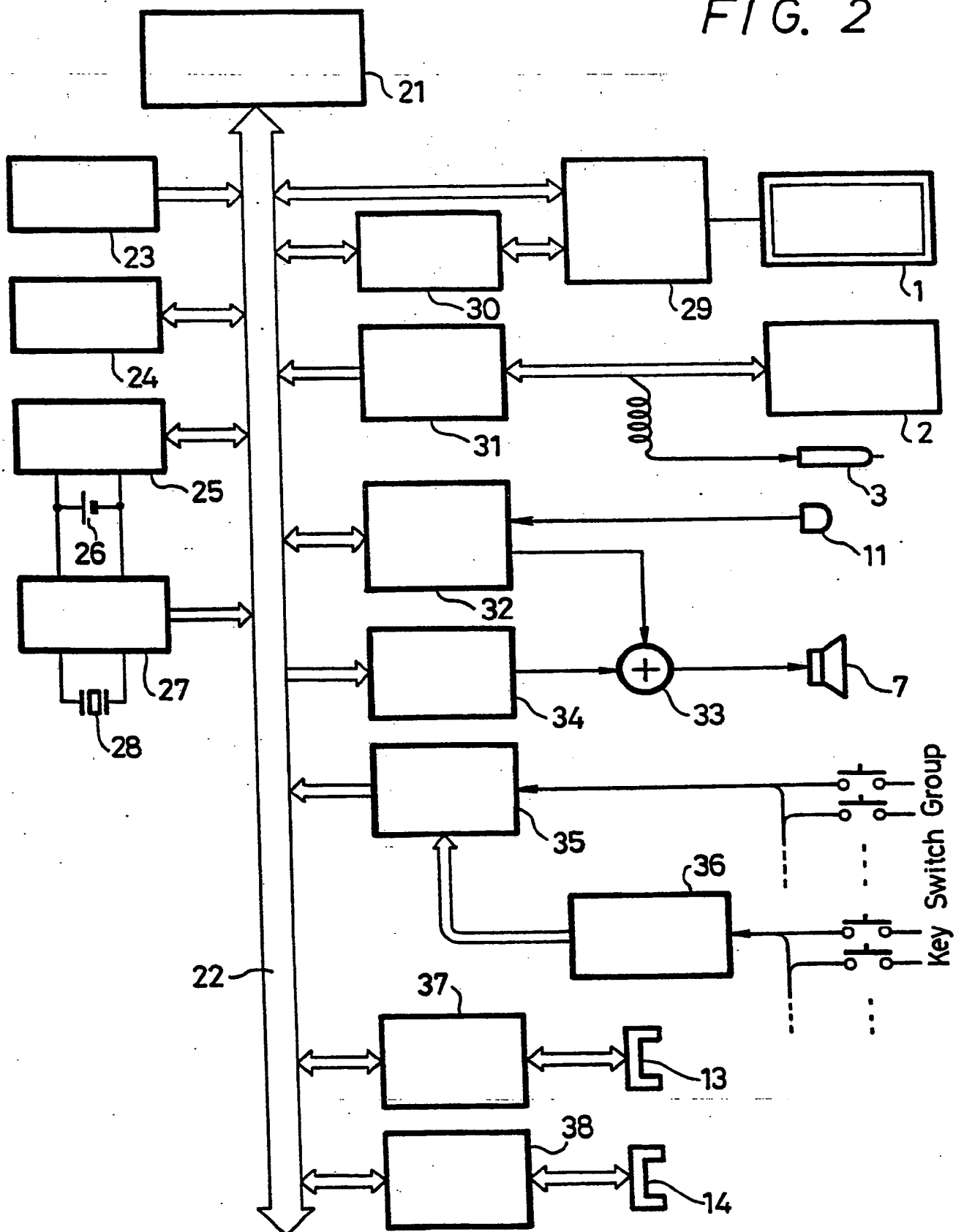


FIG. 3

YEARLY MONTHLY WEEKLY **DAILY** ADDRESS PHONE ACTION HISTORY

DEC. 20 (TUES)

A.M. P.M.

7 8 9 10 11 0 1 2 3 4 5 6 7 8 9 10

EVENTS

Fundamental Design

Design of Icon

Lunch With Mr. Teras

Writing Center

18 (SUN) 19 (MON) 20 (TUES) 21 (WED) 22 (THUR) 23 (FRI) 24 (SAT)



FIG. 4

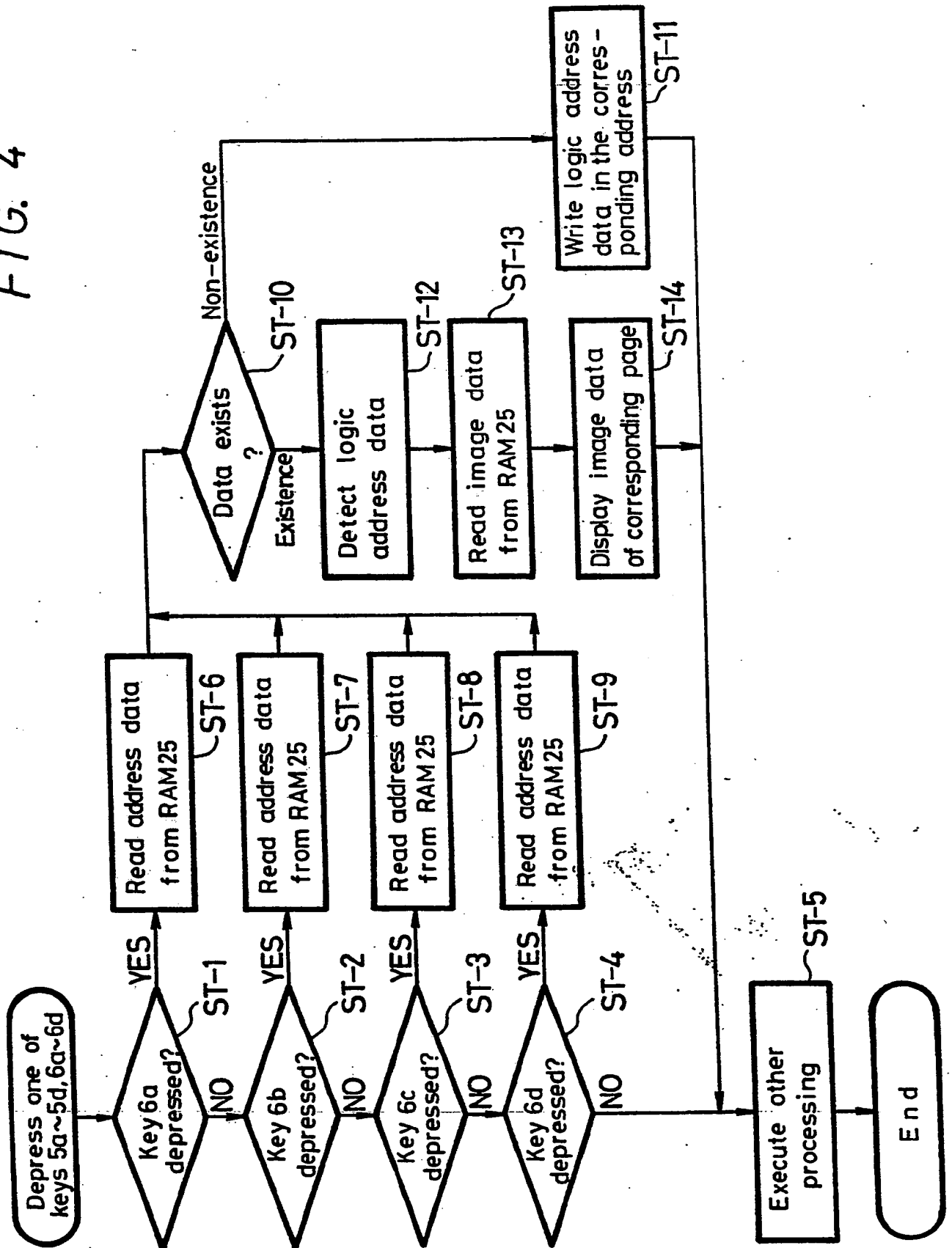


FIG. 5

